Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

NEW SERIES, NO. 130 (VOL. XVII) JUNE, 1920

QUARTERLY PUBLICATION OF THE

AMERICAN STATISTICAL ASSOCIATION

COST OF PRODUCTION STATISTICS*

BY LEWIS H. HANEY, *Bureau of Markets, Washington, D. C.*

THE ECONOMIC VS. THE ACCOUNTING CONCEPT OF COST

I. THE IMPORTANCE OF COST OF PRODUCTION STATISTICS

The importance of cost of production statistics is suggested by a mere reference to their use in connection with (1) price control, (2) taxation, (3) wage problems, (4) comparative efficiency studies, and (5) improvement of competitive conditions.

Cost of production statistics would make for *efficiency in production.* They would increase the possibility of comparative-efficiency studies, which would make the struggle for survival among different methods more intelligent. They would throw light on the vitally important question of relative efficiency of large and small scale business units. And in this connection, I would invite attention to the Federal Trade Commission's report on the cost of producing copper, in which (on page 18) it is made clear that the cost per pound varies almost inversely with the output.

I would especially call attention to the fact that cost of production statistics, if reasonably comprehensive, would be a step in the direction of encouraging *reasonable competition.* We hear much talk of reasonable restraint of trade; on the other hand, we know that there is cut-throat competition. This competition arises frequently from a lack of knowledge of cost. The collection of cost of production statistics would be invaluable as an education to the business men of the country. I think it may safely be said that if each and every producer knew his own true cost, competition would be revolutionized. Indeed, on the assumption which I have just made, it might safely be hoped that economic theory would go far toward fitting actual industrial facts, for ignorance has always stood in the way of the possibility of applying the economic theory.

---

* Read before the eighty-first annual meeting of the American Statistical Association.

In addition to these more practical advantages, there is every reason to believe that economic and statistical theory would be greatly enriched and to some extent corrected by the collection of cost statistics. Such work as has been done thus far certainly whets the scientific appetite. I refer to the recently published cost studies of the Federal Trade Commission (coal, copper, etc.) and the report of the Tariff Commission on costs in the sugar industry. Such studies may enable us to answer conclusively such questions as: What scale of operations is most economical? Is large-scale operation ever profitable in agriculture? What proportion of total cost consists of "labor"? Is there any profit at the margin? The importance of presenting series of cost figures and of throwing light on dispersion, will be apparent.

Proceeding largely on the basis of my recollection of the data I observed when connected with the Federal Trade Commission, I will venture to say that in the case of such industries as copper, lumber, coal, sugar, and cement, the following points will be found to be true:

(1) Commonly, the costs of different plants vary widely, a range of as much as 100 per cent being frequent.

(2) If curves be plotted representing a series of company or plant costs, they will be found to have a rather uniform and regular, though somewhat asymmetrical shape, owing to the fact that a majority of the plants are grouped not far from the average cost, with relatively small groups of high-cost and low-cost companies at the extremes.

(3) Somewhat over half the output in any industry (of the class indicated), however, will come from companies whose costs are less than the average; but this does not mean that the larger plants or companies will have the lowest costs. Put in another way, the weighted average cost will be somewhat less than the simple average of company or plant costs, though not necessarily much less. It will also be lower than the median cost, but will sometimes be greater than the modal cost.

(4) The modal cost may be greater or less than the median cost in the series, depending to a considerable extent upon whether the number of relatively high-cost units (companies or plants) is great enough to pull up the median. (Monopolistic control, enabling inefficient producers to survive, is often indicated by a modal cost which is much lower than the median. It is interesting to note that this situation is indicated to exist in some of the industries investigated by the Federal Trade Commission, these often being pathological cases!)

(5) Ordinarily a considerable percentage of the output will be found to come from plants or companies whose total costs are higher than the

price of the product sold, perhaps between 10 per cent and 20 per cent of the total output coming from such extra-marginal concerns.

(6) There will generally be a sharp break upwards in the cost curve at this point, which will often correspond to the marginal point.

(7) A little lower on the cost curve, there will generally be a more gradual rise, commencing at a cost which will cover from 70 to 75 per cent of the total output. This point will often correspond to the modal cost.

The foregoing generalizations are illustrated by the following cost statistics taken from reports of the Federal Trade Commission:

NEWS PRINT PAPER COSTS, 1915

Cost Groups	No. of Mills	Produced (Tons)	Per Cent of Total	Avg. Cost per Ton
Less than $27	3	195,830	19.1	$26.64
$27 and less than $30	2	138,934	13.5	28.51
$30 and less than $33	8	260,505	25.4	31.64
$33 and less than $36	11	276,672	27.0	34.75
$36 and less than $40	8	120,199	11.7	37.74
$40 and over	3	33,321	3.3	43.67
Total	35	1,025,461	100.0	$32.21

Average cost . . . . $32.21 =60% of output
Median . . . . 34.58 =85% " "
Mode (est.) . . . . 35.17 =85% " "
Range of costs: $25.77 to $44.41 per ton.
Average price =$38.45*

* Average net realization

COPPER COSTS, 1918

Cost Groups	No. of Companies	Production 1918	Per Cent of Total	Accumulated Per Cent
Cost less than 12 cents	2	122,245,051	5.41	5.41
Cost between 12 and 13 cents	4	208,571,191	9.24	14.65
Cost between 13 and 14 cents	4	314,553,177	13.93	28.58
Cost between 14 and 15 cents	4	359,617,743	15.92	44.50
Cost between 15 and 16 cents	2	98,307,293	4.35	48.85
Cost between 16 and 17 cents	8	460,528,645	20.39	69.24
Cost between 17 and 18 cents	9	255,399,696	11.32	80.56
Cost between 18 and 19 cents	3	72,373,388	3.20	83.76
Cost between 19 and 20 cents	5	28,491,436	1.26	85.06
Cost between 20 and 21 cents	5	36,871,193	1.63	86.65
Cost between 21 and 22 cents	9	135,538,602	6.00	92.65
Cost between 22 and 23 cents	3	60,861,465	2.70	95.34
Cost between 23 and 24 cents	5	44,919,772	1.99	97.32
Cost between 24 and 25 cents	1	6,230,694	.28	97.66
Cost between 25 and 26 cents	3	7,605,224	.34	97.90
Cost over 26 cents	18	46,119,555	2.04	100.05
Total all companies	85	2,258,234,125	100.00	....

Average cost . . . . 16.17 cents =69% of output
Median (est.) . . . . 20 cents =85% " "
Mode (est.) . . . . 17+ cents =80% " "
Range of costs =about 10 cents to over 30 cents per pound.
Average price =24.7 cents per pound.*

* Price fixed by the War Industries Board.

It will be observed that over 60 per cent of the output comes from companies or mills producing at costs under the weighted average, and that about 80 per cent of the output is covered by the modal cost. In comparing costs and prices, allowance for interest on investment may be made by remembering that the average investment per pound of copper was $0.30, so that 1.5 cents would yield 5 per cent. Also, that paper mills realized an average gross profit of $5.60 per ton from average net sales of $38.45,* which yielded about 6 per cent on the average investment; *i. e.*, $5 per ton would about yield 5 per cent on investment. At this rate, 16 out of 35 mills failed to make more than bare interest on investment, and 5 showed a positive loss.

II. THE NATURE OF COST, AND THE ESSENTIALS OF A STATISTICAL CONCEPT OF COST

There are almost as many ways of defining cost as there are different interests actuating men or groups of men in production. The greatest line of cleavage in defining costs, however, is that which lies between society and the individual.

Put in the most general terms, from the social point of view, cost is the measure of the obstacles to that human activity which is directed toward the gratification of human desires. It is thus a factor in determining motives and in directing activity in production, and it owes its significance in the last analysis to its power to motivate the producer. This definition of cost can be generalized, since it does not lead to duplications or to the inclusion of elements of surplus. It is not dependant upon price, but can be used in the analysis of price determination. It is in line with the conception of costs as composed of the pains and sacrifices of those engaged in production. But note that it is broader than "pain cost" in that it would include the exhaustion of natural resources. Robinson Crusoe on the desert island had to husband his scanty supply of powder; and with a nation, or a society, the facts that there is a limited supply of some raw material that is necessary to the life of that nation or society, and that this resource is being exhausted by production, become very significant: this condition acts as a sort of obstacle to the gratification of desires. In fact, the scope of cost becomes broadened as men's appreciation of the future becomes keener, as is illustrated by the fact that the conservation movement of today has become associated with a growing emphasis of "depletion" as an element in cost.

Individual costs differ from social costs. The end of mere individual human activity is largely, though not necessarily entirely, selfish, since it is generally concerned with the welfare of the individual and his immediate family circle or business unit. The obstacles to his activity are largely obstacles to his money-making, and his costs are generally counted as money costs. Again, from the mere individual point of view, the choice between two gains, one of which must be foregone, may seem to be an immediately motivating factor; and this has been called "opportunity cost." Also, because the individual necessarily takes a short-time point of view, it follows that he has but a very remote appreciation of the cost aspect of the exhaustion of natural resources.

---

* The price of paper was low and rose rapidly from 1915 to 1916.

Costs considered from social and individual points of view may bring the same result, if the individual actions do not clash with social welfare. An obvious case occurs in the use of labor-saving devices. A cement company may desire to install boilers and flues for the purpose of saving waste heat and recovering potash, which will both reduce the owner's money-cost, and benefit the public.

But costs from the two points of view may also conflict. Social ends, as compared with individual ends, are broader in space and more distant in time. Also, the ultimate obstacles to human activity from the social point of view do not lie in things which prevent mere money-making, but in things which limit the net increase of articles of consumption. We need continually to heed the old reminder that money-making is not necessarily production. From the social point of view, the fact that limited supplies of coal, oil, or copper are being exhausted makes it essential that each ton, barrel, or pound be counted as cost; but to the individual mine-owner, it may seem quite unnecessary to "figure depletion." Or, the individual may seek to capitalize "opportunity" by charging some raw material which he owns into his "cost of production" at the market value, instead of at its actual cost. He may deceive the public and even himself as to his true net earnings, and thus prevent the full exploitation of that material which would be in the public interest. Such individualistic manipulations make costs either too little or too big from the social point of view, tending either to retarded production or to wasteful over-production. Moreover, such procedure defeats the very purpose of statistics, for the particular "opportunity," or appraised market-value, "costs," being hypothetical and estimated, cannot be counted as actual things, and if taken as estimates, are bound to result in hopeless duplication or in the inclusion of elements of surplus. They cannot be generalized.

In my judgment, an important problem in connection with cost of production statistics is so to define costs that statistics of cost will bring us correct results from a true social point of view. The true point of view must be one that, while recognizing the existence of individual interest, will seek to harmonize individual or class interests; one which, in other words, will combine the two points of view—one which can be generalized.

Another distinction which has to be drawn is that between *economic costs and accounting costs.*

The accountant, in his work, necessarily takes a rather individualistic point of view, for he is employed to "get results" for an individual business.

He is concerned with money costs. Costs, from the accountant's point of view, represent actual money paid out. They concern the administration of the operations of the business unit, and consist of payments made for the labor which may be hired, for material which must be purchased, and for such general expenditures as are incurred, including depreciation. When the business is forced to borrow money to meet some current obligation, or when it is forced to rent a piece of land or a building, the interest paid on the money borrowed, and the rent actually paid, are items of out-go which cannot be funded or capitalized, but must be met if the business is to continue. Such payments are therefore costs. It follows that accounting costs are tangible and of record. They can be counted. They do not, however, reveal true total payments for the several economic factors. The "labor" item as generally found on the books is merely the "pay-roll" and does not include either the administrative or managerial labor, or the "labor" tied up in purchased raw materials in non-integrated concerns, and in "materials and supplies" in all concerns. Moreover, the interest and rent items can truly include only the amounts paid out, which do not correspond to the economist's "shares"; and in accounts there is confusion between land and buildings, as is general in the business world.

The accountant deals with the relations between a particular owner and his particular business, accounts being designed for the purpose of exhibiting exactly this relation. It follows, therefore, that the accountant regards rent on the particular property owned, and interest on the particular investment as income, for they come in to the owner (his employer) from his property or business. He cannot consider all capital goods, nor account for the total interest share.

In fact, rent on property owned, interest on the investment, and profits, are inseparable in accounting. They cannot be regarded as out-go, and so are not costs to the accountant. There is always a financial purpose of enabling the owner to deduct from his particular income the necessary out-of-pocket payments, in order that he may ascertain what is his true net income. It is only when such income is ascertained that interest on investment and profits can be known.

Obviously, the sum of particular accounting costs does not correspond to the sum of economic costs. With books kept as at present, we cannot get even the true total labor expense for any given product, especially in case the production is non-integrated. Moreover, salaries are often either nominal, or represent a distribution of profit; and materials, raw and other, are charged at fluctuating market values. Interest does not represent the cost of the capitalist, but merely a contractual payment on sums borrowed; and estimated interest on investment is hopelessly mixed with profits, rent, and hypothesis.

It is to be noted that from the accountant's point of view, costs concern payments made by the *producer*, and not payments made by the *consumer*. It follows that from the accountant's point of view, cost cannot normally equal price, but will be somewhat less.

The economist's costs are somewhat different from accounting costs. He has to consider from the point of view of society the problem of the total supply of capital goods, and the direction of their use. His interest in any particular investment and the return thereon, is incidental. He is therefore concerned with interest as representing a social cost. Economic theory can and does separate rent, interest, and profits; for it is not concerned with the profit and loss sheet of a given business or of any particular property. To the economist as a student of normal competitive conditions, cost is not what the owner or operator pays out, but is the equivalent of what the consumer pays, and he considers it both from the point of view of the consumer and from the point of view of its effect upon production. Therefore, his cost must equal the price. Price, he regards as an expression of the forces tending to equilibrate demand and supply.

It should be observed that there is a small minority among both accountants and economists who are seeking to combine the two points of view and make accounting and economic costs identical. Among economists this minority consists of those who would recognize the so-called "opportunity cost" as a price-determining cost. A few accountants would treat interest on investment as operating cost. Although they have very diverse motives and interests, both of these groups assume an extremely individualistic point of view, and proceed upon the assumption that price determines cost. With both, the costs are not actual, but hypothetical. Both would disregard the interests of society in seeking to equalize the inefficient or the parasitical with the efficient and the socially productive.

In the reference already made to accounting costs, the distinction between the owner and the operator has been pointed out, and this distinction is essential if the various conditions which arise in dealing with accounting costs are to be understood. The owner stands for capital; the operator for enterprise, which is generally identified with the manager. Accordingly, the accounts which will satisfy the mere owner's interest are not at all those which would satisfy the operator. Owner accounts concern the relation between the owner and his property, and consist primarily of a balance sheet and an income account or profit and loss statement. Operator accounts show the relation between the operator or manager and the operation which he directs, and consist primarily of "cost sheets," which have their relation to the owner accounts in that they must be carried into the profit and loss statement, which in turn serves to connect the income account with the balance sheet. The owner's accounts center in profits, including interest on investment; the operator's accounts center in out-go costs, including wages, materials, and general expenses.

Closely parallel to the foregoing distinction is the distinction between "cost of sales" and "cost of production." By "cost of sales" is here meant cost in the sense of all deductions made from operating income, and such costs are reducible to a unit basis by using the quantity sold as a divisor. In getting the cost of sales, therefore, we have to consider the change in total value of inventories. To the operating man, the fact that the value of inventories decreases during a given period of time makes no difference, but to the owner, it may be of vital importance. In order to ascertain the profit or loss for the business, it is necessary that a net decrease in the total value of inventories be added to cost, and it is only thus that cost can, as the phrase runs, "tie into" the profit and loss account, and thus into the balance sheet. The quantity sold must be used as the divisor, for the owner is concerned, after all, not with what is produced, but with what is marketed; not directly with cost, but with total net income.

It should be noted, too, that the cost of sales is but a hypothetical cost, including as it does an estimated value of inventories, which being stock on hand has not been sold, and might, if actually put upon the market, bring a different price from that at which it is carried on the books.

Production cost, or output cost, as it might be called to distinguish it from cost of sales, does not consider inventories, but represents what it actually would cost at the present time to replace the stocks of product on hand. The divisor used is the quantity actually produced during the period of time under consideration, and the dividend is the sum of the operating expenses actually paid out or chargeable to the operation involved in the production of the quantity used as a divisor. It is production or output cost, as distinguished from cost of sales, with which the nation or society is interested, and which should be used for the purpose of regulating prices.

Another phase of the distinction between owner costs and operator costs is suggested by the terms "conversion" and "capital replacement." The owner is interested in capital replacement, but this is not true of the operator, as such. In accounting, conversion, or manufacturing cost, is the operating expense strictly construed, and consists of payments made by the operator for labor, materials, etc. It may include interest actually paid on money borrowed to meet current expense, but not interest on investment. Such conversion cost will include maintenance and repairs which are required to keep the plant and equipment going, but not depreciation which is over and above maintenance and repairs, and occurs in spite of them. Capital-replacement cost, on the other hand, concerns the charges necessarily made to return to the owner his property when it is worn out or exhausted, and may be divided into three heads, depreciation, extinguishment, depletion. The last two are less understood, and a word may be added concerning them. If a lumber mill buys timber land sufficient to enable it to operate for ten years, it constructs a railway for logging supplies, and a saw-mill, installing all equipment connected with these operations. It may build a town, and establish a commissary. The life of these items may be considerably longer than ten years. It therefore becomes proper and necessary for the lumber man to write off the cost of his plant over a period of ten years, and this is what is meant by extinguishment charges. Depletion is similar, but concerns the exhaustion of the raw material itself.

It will be observed that "capital replacement costs" do not exactly coincide with "owner costs" (as distinguished from operating costs), since they include wear and tear, which is an operating item. Also, although they bear some relation to cost of sales, in regarding inventories as an item of capital, the two costs are otherwise quite different.

With the foregoing distinctions in mind, we may say that in laying a basis for cost of production statistics:

1. We must proceed from a social point of view, which will consider as costs things which will actually motivate individuals, but which exclude factors that cannot be generalized, either because they tend to destroy society by motivating anti-social activities of individuals, or because they involve duplication (or negation).

2. We must secure data from accounts and accounting costs, but we must use them to portray economic facts. Ultimate economic costs

cannot be counted; we probably can never hope for very close statistical measurement of sacrifices, pains, or exhaustion of natural resources. Accounting costs are the only actual data available. (The so-called "entrepreneur costs," if they mean anything different from accounting costs, are unreal or even socially vicious, to say nothing of the duplications or negations that would result from an attempt to enumerate and total them.)

3. There are important limitations on accounting data which must be removed if true statistical results are to be gained. (a) Accounts cannot show us the total labor cost, to say nothing of interest, uninsurable hazards, and rent. (b) Accounts require much analysis to eliminate false items and duplication. (We cannot assume that errors will offset each other.) (c) Accounts probably will never show us the true total cost of any good, as they include a considerable element of goods and services taken in at market values. This may be especially difficult to deal with when a good is procured by a series of non-integrated concerns.

4. We will be interested primarily in cost of production, not of sales, as it is this which determines public policy and private activity in the long run.

5. We should include items from both owner and operator costs, taking in both conversion and capital-replacement charges. In this connection it is essential to secure accurate data on cost of investment.

The problem all the way through is to prevent the taking of interest and profits on any *particular* investment for granted, or in other words, to prevent giving out statistics which will tend to establish a guarantee of rates on any particular investment. Also, conversely, a second problem is to establish conditions based on statistical information which will help wise and honest investments to make a fair rate of return.

Concretely stated, the foregoing distinctions may be applied, and an approximation to the solution of the foregoing problems be reached, by making our costs include certain items which are sometimes not included, and excluding certain items which are often included. Some of the more important, according to my experience, are as follows:

Items to be included in cost:
- (1) Depreciation
- (2) Extinguishment
- (3) Depletion
- (4) Wages of managers and executives
- (5) Losses due to shrinkage, spoilage, etc.

Items to be excluded from cost:
- (1) Charges against income (excess profit taxes, interest on investment, etc.)

(2) Contingency reserves and uninsurable hazards
(3) Distribution of profits (excessive salaries)
(4) Inter-company profits and inter-departmental profits
(5) Capital charges
(6) Costs not properly connected with the given operation or time, ("outside operations," undue proportion of long-time charges)

Items required in addition to cost:
- (1) Investment (actual expense and depreciation charged off in the past)
    - (a) Reserves of raw materials (ore, oil, stumpage, etc.)
    - (b) Land (factory and office sites)
    - (c) Plant and equipment (buildings, machinery, etc.)
- (2) Property used in addition (leased, etc.)
    - (a), (b), (c), as above.

If we continue to use accounting costs, we should do so with a more intelligent appreciation of their limitations. In any case, we can forswear that hybrid monster which the economist calls "opportunity cost," and the accountant calls "interest on investment."

III. SOME PRACTICAL QUESTIONS CONNECTED WITH THE COLLECTION, COMPILATION, AND PRESENTATION OF COST OF PRODUCTION STATISTICS

How should cost-of-production statistics be collected? It would involve a very careful preliminary study of representative companies in each industry selected. As a result, a schedule, or schedules, would be prepared, and would be the basis for collecting the bulk of the data required. There would have to be a check with the books of representative companies, which makes it important that the body collecting the figures should have power by law to go to the books and records. I may say that my experience convinces me that even the best of cost schedules cannot be entirely satisfactory, and that questions are bound to arise which must be answered by correspondence, and in many cases, by scrutiny of the accounts. In this connection, it will be important at times to check the cost figures into the profit and loss account; and the schedule, to be satisfactory, must certainly call for a statement of the actual investment and depreciation, and such controlling figures as the quantity produced, quantity sold, the total expense, the addition to surplus, and the distribution of profit.

The scope of cost of production statistics would be an important matter to decide. The industries to be covered would be decided on the basis of their importance and the known difficulties of getting satisfactory results from them. It would be expedient to consider the advisability of going on with the work already done by the Federal Trade Commission and other bodies, covering such industries as coal, steel, oil, lumber, sugar, and copper. In not a few cases it will be found necessary to await accounting progress. In more than one industry of considerable magnitude, it will today be found virtually impossible to secure accurate cost data.

The areas, and the numbers of companies to be covered, may be various, and it will be found impossible to cover 100 per cent of the production in most if not all cases. The smallest companies, especially if it is assumed that these are the least efficient, may be omitted. The remaining companies may be grouped and graded, and a simpler schedule used for the smaller companies, with a more detailed one for the larger, for the latter generally have better accounts.

The frequency of reports is a matter of great importance, as the value of these figures, from a practical point of view, varies almost inversely with the time which elapses between the period covered and their presentation. On the other hand, the difficulty of securing current costs is enormous, for it may also be said that the correctness of cost figures varies almost inversely with the shortness of the period covered. Monthly or quarterly costs are bound to be rather unsatisfactory, inasmuch as certain items of expense have to be estimated and prorated. In some industries, like the production of rosin and turpentine, for example, where there is a seasonal cycle of production, it is doubtful if satisfactory figures can be secured for any period less than a year.

Perhaps the most interesting practical question is the consideration of the details with which the investigation would be concerned. In the first place, I will say that the costs should be analyzed into three great divisions, labor, materials, and expense. This is the most feasible distinction of public value that the accounts in general permit. Moreover, it has a practical advantage in the fact that most of the errors in cost statistics come in the item of "expense," and this segregation therefore would facilitate checking.

One great problem lies in the distinction between what we may call departmental costs and economic costs. Each department of a business, taking the material through various stages to the shipping stage, involves labor, materials and supplies, etc., and with the present accounting development, it probably would be impracticable to get these departmental costs satisfactorily. To give but one concrete reason, the item of "maintenance and repairs" is not available by departments in many industries. While costs by departments are extremely valuable to the manufacturer, it must be remembered that the total of departmental costs per unit will not check with the total cost of business, on account of the different quantities of material which pass through the different departments in any given period.

Two other suggestions: first, in handling joint costs, it would probably be wise at the outset to do no more than to attempt to get the average cost per unit of all the joint products combined, though it would be highly important to get the quantity and selling price for each product. Second, I would stress the importance of securing exact information as to the quantities produced, sold, and in inventory,—which, by the way, is a limiting factor, inasmuch as such figures are often much more difficult to secure than one would suppose.

In conclusion, I would point out that the amount of checking required is related to the degree of competition in the industry. It will be remembered that "costs" can be manufactured like any other product, and however optimistic we may be, we would be foolish to shut our eyes to the established fact that manipulation in costs is not only known to exist, but is known to exist frequently. Now, where we have monopoly, it is necessary to have compulsory access to books and returns must be carefully checked. Where we have limited competition a thorough check is necessary. Where, however, we have free competition—as is sometimes the case—we may accept the costs as reported by the company, with a great deal more assurance. However, considerable checking would be required, even here, as in matters of taxation, wage adjustments, etc., common motives would color men's treatment of cost, no matter how much competition there might be.